N00104-89-MA16
ITEM 164 FY90
CEL-DS1
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PURCHASE DESCRIPTION

MICROWAVE SWEEP GENERATOR (10 MHz to 40 GHz)

GE1RT-B

1.0 GENERAL These salient characteristics describe a microwave sweep generator covering a frequency range of 10 MHz to 40 GHz employing no more than two plug-in heads and one mainframe.

2.0 CLASSIFICATION The sweep generator described herein shall meet the requirements of MIL-T-28800D, Type III, Class 5, Style E, Color R for Navy shipboard, submarine and shore applications with the following modifications and exceptions:

a. Non-operating temperature: -40˚C to +70˚C

b. Temperature/humidity: Non-condensating

c. Altitude: Not required

d. EMI requirements: Not required

e. The equipment warm-up period is increased to 1 hour.

3.0 OPERATIONAL REQUIREMENTS

3.1 Frequency Characteristics

3.1.1 Frequency Range: 10 MHz to 40 GHz; a maximum of two plug-ins or RF outputs allowed

3.1.2 Frequency Resolution: The displayed frequency resolution shall be at least 1 MHz.

3.1.3 Frequency Accuracy (measured at 25˚C ±5˚C): ±20 MHz from 10 MHz to 40 GHz

3.1.4 Frequency Stability (less than the limits specified below)

3.1.4.1 Temperature (over 0-50˚C operating range): ±1 MHz/˚C from 10 MHz to 20 GHz and ±2 MHz/˚C from 20 to 40 GHz

3.1.4.2 Line Voltage (±10% line voltage variation about 115 Vac): ±200 kHz from 10 MHz to 20 GHz and ±400 kHz from 20 to 40 GHz

3.1.4.3 Warm-up (1 hour after power turn-on): ±1 MHz/10 minutes from 10 MHz to 20 GHz and ±4 MHz/10 minutes from 20 to 40 GHz

3.1.5 Residual FM in CW Mode (measured in 50 Hz to 15 kHz bandwidth): Less than 15 kHz peak for frequencies below 20 GHz and less than 20 kHz peak for frequencies from 20 to 40 GHz

3.1.6 Spectral Purity (at least the limits specified below)

3.1.6.1 Harmonics/Sub-harmonics: -25 dBc for frequencies from 10 MHz to 2.4 GHz, - 40 dBc for frequencies from 2.4 to 26.5 GHz and - 20 dBc for frequencies from 26.5 to 40 GHz

3.1.6.2 Spurious/Non-harmonics: -25 dBc for frequencies from 10 MHz to 2.4 GHz and -50 dBc for frequencies from 2.4 to 40 GHz

3.2 Output Characteristics

3.2.1 Output Connectors: Ruggedized coaxial (SMA compatible); VSWR <2:1 for frequencies from 10 MHz to 26.5 GHz and WR 28 waveguide or ruggedized coaxial, SMA compatible; VSWR <2.5:1 for frequencies above 26.5 GHz

3.2.2 Output Level (minimum value of maximum leveled output): +2 dBm leveled for frequencies from 10 MHz to 18.6 GHz and 0 dBm leveled for frequencies from 18.6 to 40 GHz

3.2.3 Output Level Adjustment Range: 60 dB for frequencies from 10 MHz to 40 GHz

3.2.4 Output Display: Digital readout of output power level; resolution 0.1 dB

3.2.5 Level Accuracy (displayed level vs measured output level, measured at 25'C ± 5'C): from ± 2.0 dB for frequencies from 10 MHz to 40 GHz internally leveled

3.2.6 Output Level Variation: ±1.5 dB for frequencies from 10 MHz to 40 GHz leveled

3.2.7 Attenuator Error: Maximum attenuator error shall be less than ±2.0 dB (10 MHz to 40 GHz)

3.3 Modulation Characteristics

3.3.1 Amplitude Modulation (AM)

3.3.1.1 Internal AM (square wave)
3.3.1.1.1 Rate: 1 kHz and 27.8 kHz
3.3.1.1.2 On/Off Ratio: Greater than 20 dB
3.3.1.2 External AM
3.3.1.2.1 Rate: 10 Hz to 50 kHz
3.3.1.2.2 Input Impedance: nominally less than 30 kilohms
3.3.1.2.3 Amplitude Control: At least 13 dB
3.3.1.2.4 Maximum Input: 15 V

3.3.2 Frequency Modulation (FM)

3.3.2.1 External FM
3.3.2.1.1 Deviation: 0 to ±7 MHz for frequencies from 10 MHz to 40GHz
3.3.2.1.2 Rate: 10 Hz to 100 kHz
3.3.2.1.3 Sensitivity: Greater than 5 MHz/V

3.4 Sweep Characteristics

3.4.1 Range: 10 MHz to 40 GHz

3.4.2 Sweep Function: Start/Stop, CW, ΔF, Marker

3.4.3 Trigger Modes: Internal (automatic), line, external, single

3.4.4 Frequency Markers: At least 5; both amplitude and frequency

3.4.5 Sweep Time: Adjustable from at least 150 msec to 99 sec over any portion of the band

3.5 Displays (digital)

3.5.1 Frequency: Start/Stop, CW, CF/ΔF (4 digits)

3.5.2 Marker/Time: Marker frequency or sweep time (3 digits)

3.5.3 Output Level: Output signal level in dBm (3 digits)

4.0 GENERAL REQUIREMENTS

4.1 Power: 115 Vac, 50/60 Hz ±10%, 400 watts

4.2 Dimensions: Less than 2000 cubic in (32,744 cubic cm); maximum height allowable 153 mm (6 inches) including feet.

4.3 Weight: Less than 65 lbs (29.5 kg)

4.4 Local Operation: All front panel control settings shall be storable in non-volatile memory for future recall.

4.5 Remote Programming: Instrument must be capable of operating via the IEEE interface bus and shall provide the capability to talk and listen.

4.6 Diagnostics: Functional self-test and troubleshooting shall be accomplished using front panel controlled diagnostic functions.

4.7 Rack Mountable

4.8 Calibration Interval: After calibration the equipment shall meet each performance requirement within the specified tolerences for a period of at least 12 months.

4.9 Accessories:

4.91 If coaxial output connector is not SMA compatible, adapter to SMA is required

4.92 If output is coaxial to 40 GHz, coaxial to WR-28 waveguide adapter for 26 to 40 GHz is required.